

CLAIMS

1. (original) A conformable veil comprising:
a plurality of fibers having an average length of between approximately 0.5 and 2 meters; and
a polystyrene-based binder applied to said plurality of fibers, said polystyrene-based binder being substantially soluble in a sheet molding compound resin paste.
2. (original) The conformable veil of claim 1, wherein said plurality of fibers have an average length of between approximately 1 and 2 meters.
3. (original) The conformable veil of claim 2, wherein said polystyrene-based binder comprises approximately 10 percent of the total weight of said conformable veil.
4. (original) The conformable veil of claim 3, wherein said plurality of fibers comprises a plurality of glass fibers.
5. (original) The conformable veil of claim 2, wherein said polystyrene-based binder is formed from a polystyrene-based emulsion in water.
6. (canceled)
7. (original) The conformable veil of claim 2, wherein when said veil is compression molded, said binder is substantially dissolved in a resin, and said veil elongates wherein said plurality of fibers have an average fiber diameter of between approximately 11 and 14 micrometers.

8. (original) The conformable veil of claim 2, wherein said veil, when compression molded, elongates over 50% without any visible holes or tears.

9. (original) The conformable veil of claim 8, wherein said veil, when compression molded, elongates over 100% without any visible holes or tears.

10. (original) The conformable veil of claim 9, wherein said veil, when compression molded, elongates over about 400% without any visible holes or tears.

11. (withdrawn) A sheet molding composite sheet comprising:
a first layer of resin paste;
a second layer of resin paste; and
a conformable veil sandwiched between said first layer and said second layer, said conformable veil comprising a plurality of fibers bound together with a polystyrene-based binder and having an average length of between approximately 0.5 and 2 meters.

12. (withdrawn) The sheet molding composite sheet of claim 11, wherein said veil comprises a plurality of fibers having an average length of between approximately 1 and 2 meters.

13. (withdrawn) The sheet molding composite sheet of claim 11, wherein said polystyrene-based binder comprises approximately 10 percent of the total weight of said conformable veil.

14. (withdrawn) The sheet molding composite sheet of claim 11, wherein said polystyrene-based binder is substantially soluble in said first layer of resin paste and said second layer of resin paste.

15. (withdrawn) The sheet molding composite sheet of claim 11, wherein said plurality of fibers comprises a plurality of glass fibers.

16. (withdrawn) The sheet molding composite sheet of claim 11, wherein said polystyrene-based binder is formed from a polystyrene-based emulsion in water.

17. (withdrawn) The sheet molding composite sheet of claim 16, wherein said polystyrene-based emulsion comprises Vinamul 7700.

18. (withdrawn) The sheet molding composite sheet of claim 11, wherein said plurality of fibers have an average fiber diameter of between approximately 11 and 14 micrometers.

19. (withdrawn) The sheet molding composite sheet of claim 11, wherein said veil, when compression molded, elongates over 50% without any visible holes or tears.

20. (withdrawn) The sheet molding composite sheet of 19, wherein said veil, when compression molded, elongates over 100% without any visible holes or tears.

21. (withdrawn) A method for forming a relatively smooth sheet molding compound composite part having good binder and fiber distribution, the method comprising:

forming a conformable veil, said conformable veil comprising a plurality of fibers having an average length of between

approximately 1 and 2 meters and a polystyrene-based binder applied to said plurality of fibers;

forming one or more plies of a sheet molding compound compacted sheet, each of said plies comprising a layer of said conformable veil placed between a first layer of a resin paste and a second layer of said resin paste;

introducing at least one of said one or more plies to a molding device, one of said one or more plies of said sheet molding compound compacted sheet being located at a visible surface of said molding device to form the sheet molding composite part;

molding said at least one of said at least one plies within said molding device, wherein said molding step causes said polystyrene-based binder of said conformable veil to substantially dissolve within said first layer and said second layer of said at least one plies.

22. (withdrawn) The method of claim 21 further comprising:

providing at least one ply of a laminated sheet, said laminated sheet comprising a plurality of chopped fiber reinforcements coupled within a third layer of a second resin paste and a fourth layer of said second resin paste, said second resin paste being compatible with said resin paste; and

introducing at least one of said at least one ply of laminated sheet to said molding device, wherein each of said at least one of said at least one ply is located at a position further away from said visible surface than said one or more plies of said sheet molding compound compacted sheet.

23. (withdrawn) The method of claim 21, wherein forming a conformable veil comprises:

forming a plurality of glass fibers having a length of between about 1 and 2 meters and an average diameter of about 11 to 14 micrometers;

forming a random mat of said plurality of glass fibers;

impregnating said mat with a polystyrene-based emulsion;
introducing said impregnated mat to an oven at a first
temperature, said first temperature sufficient to melt bond said polystyrene-
based emulsion to said plurality of glass fibers to form the conformable veil
without melting said plurality of glass fibers; and
removing said conformable veil from said oven.

24. (withdrawn) The method of claim 23, wherein said first
temperature is between approximately 100 and 150 degrees Celsius.

25. (withdrawn) The method of claim 21, wherein forming one or
more plies of a sheet molding compound compacted sheet comprises:
providing a lower carrier film;
introducing a first layer of paste onto said lower carrier film;
introducing said conformable veil onto said first layer of
paste;
introducing a second layer of paste onto said conformable
veil;
introducing an upper carrier film onto said second layer of
paste to form a sheet molding composite sheet;
compacting said sheet molding composite sheet; and
maturing said compacted sheet molding composite sheet.

26. (withdrawn) The method of claim 22, wherein said second resin
paste has the same composition as said resin paste.

27. (withdrawn) The method of claim 23, wherein forming a plurality
of glass fibers comprises:

forming a plurality of fibers an average diameter of about 11 to 14 micrometers; and
chopping said plurality of fibers to an approximate length of between 0.5 and 2 meters.

28. (previously presented) A conformable veil comprising:
a plurality of fibers having an average length of between approximately 0.5 and 3 meters; and
a polystyrene-based binder applied to said plurality of fibers, said polystyrene-based binder being substantially soluble in a sheet molding compound resin paste.

29. (previously presented) The conformable veil of claim 28, wherein said plurality of fibers have an average length of between approximately 1 and 2 meters.

30. (previously presented) The conformable veil of claim 28, wherein said polystyrene-based binder comprises approximately 10 percent of the total weight of said conformable veil.

31. (previously presented) The conformable veil of claim 28, wherein said plurality of fibers comprises a plurality of glass fibers.

32. (previously presented) The conformable veil of claim 28, wherein said polystyrene-based binder is formed from a polystyrene-based emulsion in water.

33. (previously presented) The conformable veil of claim 28, wherein when said veil is compression molded, said binder is substantially dissolved in a

resin, and said veil elongates wherein said plurality of fibers have an average fiber diameter of between approximately 11 and 14 micrometers.

34. (previously presented) The conformable veil of claim 28, wherein said veil, when compression molded, elongates over 50% without any visible holes or tears.

35. (previously presented) The conformable veil of claim 28, wherein said veil, when compression molded, elongates over 100% without any visible holes or tears.

36. (previously presented) The conformable veil of claim 28, wherein said veil, when compression molded, elongates over about 400% without any visible holes or tears.

37. (previously presented) A conformable veil comprising:
a plurality of fibers having an average length of between approximately 1 and 3 meters; and
a polystyrene-based binder applied to said plurality of fibers, said polystyrene-based binder being substantially soluble in a sheet molding compound resin paste.

38. (previously presented) The conformable veil of claim 37, wherein said plurality of fibers have an average length of between approximately 2 and 3 meters.

39. (previously presented) The conformable veil of claim 37, wherein said polystyrene-based binder comprises approximately 10 percent of the total weight of said conformable veil.

40. (previously presented) The conformable veil of claim 37, wherein said plurality of fibers comprises a plurality of glass fibers.

41. (previously presented) The conformable veil of claim 37, wherein said polystyrene-based binder is formed from a polystyrene-based emulsion in water.

42. (previously presented) The conformable veil of claim 37, wherein when said veil is compression molded, said binder is substantially dissolved in a resin, and said veil elongates wherein said plurality of fibers have an average fiber diameter of between approximately 11 and 14 micrometers.

43. (previously presented) The conformable veil of claim 37, wherein said veil, when compression molded, elongates over 50% without any visible holes or tears.

44. (previously presented) The conformable veil of claim 37, wherein said veil, when compression molded, elongates over 100% without any visible holes or tears.

45. (previously presented) The conformable veil of claim 37, wherein said veil, when compression molded, elongates over about 400% without any visible holes or tears.